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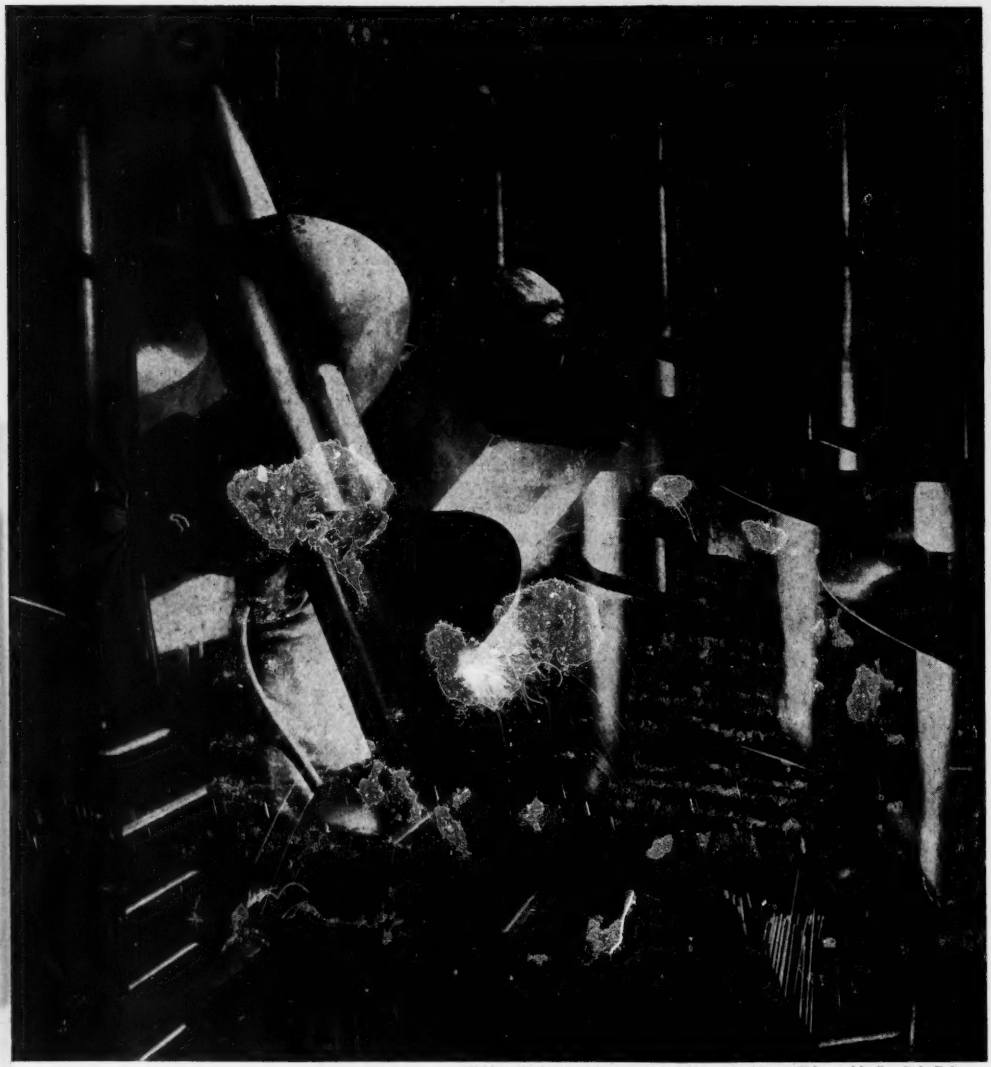

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NOTES AND COMMENTS

U.K. and U.S.A. Methods of Collecting Scrap

That one of the most serious threats to increased steel production in the U.K. is the shortage of scrap is a fact which has for long been brought to the notice of industry and the private citizen through advertisements and posters. However useful this method may be, there are times when it is felt that the drive for scrap, to be successful, demands a little more than paper proclamations. If scrap iron and steel is needed as badly as we are all meant to believe it is, so that failure to secure considerable supplies may stall this country's industrial machine, it seems an eminently reasonable question to ask what other steps the government are taking to keep the steel mills supplied. So far as we understand, the National Federation of Scrap Iron, Steel and Metal Merchants, is not having an easy task in collecting scrap partly due to the rather complicated structure by which scrap is collected and sent to the steel mills and partly due to the weak response from industry. Considerable interest, therefore, attaches to a recent report which gives a good idea of the way in which the United States, facing the same difficulties, has tackled the problem of obtaining additional supplies of scrap iron and steel.

Having set an output target of 110,000,000 tons of steel for 1952, for which 38,000,000 tons of scrap is necessary, the U.S. Government issued thousands of memoranda to individual industrial organizations operating in every sector of the nation's economy. Thus to mine and mill operators the memorandum suggested that each mine or mill appoint one man to see that scrap was sent promptly on its way to the steel mills and it pointed out that not only was it in their best interests to do so since their own continued operation depended on adequate supplies of steel, but also that the additional revenue from the sale of scrap would benefit them.

This is, however, only half the story. The U.S. Government appointed a team of four officials from the U.S. steel industry—not politicians be it noted—and sent them out to World War II battlefields in the Far East to survey the availability of iron and steel scrap. Armed with a blank cheque for $7,000,000, the team visited Japan, Korea, Formosa, Okinawa, India, Thailand and the Pacific Islands.

Although no figures have been released for publication of the quantity of scrap discovered, due in part, in the case of Korean supplies, to military reasons and in part because of the difficulty of estimating just how much scrap could be recovered from certain areas, a country by country report and the team's conclusions and recommendations have been published.

In Japan, the team found that scrap supplies were completely adequate with more than five months supplies at Japanese steel mills. At present scrap, from damaged war material in Korea was being sent to Japanese mills which in turn were supplying steel for the United Nations forces. From where we sit this appears to be a sensible arrangement, but the team recommended that such scrap be shipped instead to the United States.

Over 100,000 tons of scrap were available for delivery to the U.S.A. from Korea and it was reported that part of this tonnage would soon be despatched. Much the same position existed at Okinawa where the team found that most scrap supplies had already been sold to Japan. Here too, the team recommended that the U.S. Defense Department, which administers the island, should sell the scrap to the U.S. rather than elsewhere. Actually, substantial quantities of non-ferrous scrap had been collected and some 1,500 tons were available for shipment to the U.S.A.

A more encouraging situation confronted the team on their arrival in Formosa. 50,000 tons were found and the Chinese Nationalist Government was co-operating in shipping all scrap to the U.S. In their recommendation the team urged that steps be taken to salvage 35,000 tons of shipping sunk in Formosan Coastal waters. In Thailand the team estimated there was about 100,000 tons available but so widely scattered was it that there was no time for a complete survey. The team reported that there were very large tonnages available in India and recommended that steps be taken to secure its shipment to the United States.

Information was not forthcoming as to what tonnages of scrap were bought in the Far East, nor was anything divulged as to what they discovered in the Pacific Islands but the General Services Administration which sponsored the expedition said that the team on their arrival in the Pacific Islands would examine the possibilities of raising

197 ships sunk in the Marianas—the big naval graveyard in the Far East fighting during the last war.

That the means available to the United States to hunt down scrap and steel are vastly superior to our own is not denied but what is brought out by the foregoing is the thoroughness of the organization which goes hand in hand with any Government appeal to the nation. Obviously with such activity on the Government side there can be small room for doubt that the appeal is a sincere one and that the least business organizations can do is to match the Government's zeal in trying to find the material to enable the steel industry reach their output target.

Guatemala's Increasing Lead-Ore Output

Lead-ore output in Guatemala increased from 763 tonnes in 1949 to 6,070 tonnes in 1950; pig lead output rose from 68 tonnes to 271 tonnes, and 697 tonnes of lead-silver-copper concentrates produced in 1950 were shipped to the U.S. for smelting and refining, states a recent U.S. Bureau of Mines publication. An American company, which began mining in the Department of Alta Verapaz in 1949, continued operations throughout 1950. Output included lead carbonate ores, lead-zinc sulphide ores, and a small quantity of lead metal. The smelter operated only for a few weeks in 1950 and was closed because of technical difficulties. This company, which is holding a concession to mine lead-zinc deposits in the Department of Chiquimula, did not begin production in 1950, partly because of the low price of these two metals in the early part of the year and partly because of a disagreement with the Guatamelan authorities, on the interpretation of one article of the concession. Another American company was granted a concession to exploit lead-zinc deposits in the Department of Huehuetenango and road building and transport and installation of equipment were under way by the end of the year.

The Guatemalan company mining lead-silver-copper-bismuth-zinc deposits in the Department of Jalapa encountered difficulties in operating its smelter and discontinued production of bullion. Concentrates are now shipped to the U.S. for further processing.

Coal Mining in Poland

The development of the Polish coal industry is reviewed in a recent issue of *Polish Facts and Figures*, issued by the Polish Embassy in London. It states that in 1949, the last year of the Three-Year Plan, over 74,000,000 tons of coal were extracted, that is twice Poland's output in 1937 of 36,200,000 tons. The first year of the Six-Year Plan, 1950, is reported to have brought about an increase in production to 78,000,000 tons, and a further 3,000,000 tons increase has been planned for this year. Hence, Poland will produce this year three times more coal than in 1945 when, because of severe war-time destructions, output amounted to 27,300,000 tons. The Six-Year Plan envisages for 1955 a production of up to 100,000,000 tons, which will be achieved, among other things, by the putting into operation of eleven new mines, the exploitation of 36 new levels in existing mines as well as by an increase of 36 per cent in efficiency resulting from mechanization.

The ambitious mechanization programme, drawn up by the Polish authorities, envisages for 1955 a 67 per cent mechanization in the extraction of coal, a 65 per cent mechanization of loading and a 95 per cent mechanization of transport. In order to realize this plan, the Ministry of Mining is to increase threefold, within the Six-Year period, the production of mining machinery.

Mining "combines" and other equipment of both U.S.S.R. and Polish construction, are being used in the Polish coal industry, requiring more technical knowledge on the part of the miner and the government has, for this reason, established a comprehensive training scheme.

Brazilian Tin and Chromite

(From Our Own Correspondent)

Teresopolis, November 19

During the past year the Brazilian Department of Mineral Production (D.N.P.M.) has intensified investigation of the primary and secondary deposits of cassiterite in the basin of the Rio das Mortes, Minas Geraes (see *The Mining Journal*, June 30, 1950). Local mining companies have co-operated in the work, receiving technical assistance in return, and new refining processes have been introduced by the Empresa Mineira de Estanho, the biggest producer. Prospecting of the primary occurrences has been concentrated in two deposits along the main river, while drilling operations have been carried out in the secondary deposits on two of its affluents. The Sao Joao del Rei deposits, discovered in 1942, have a cassiterite content ranging from 66 to 73.2 per cent. The two principal mines (Paiol and Rio Abaixo) have visible reserves estimated at 8,660 tons, exclusive of veins not yet examined.

Prospecting has also been pressed forward in the Amapá Territory, where the beds have assumed increased economic importance, owing to the facilities afforded for development by the railway and port at Macapá, now being built in collaboration with Bethlehem Steel, in order to facilitate exports of manganese. A concession was granted in September to the Government of the Territory to prospect for cassiterite deposits on an affluent of the Araguari River and an area of 2,500 acres is being exploited by private enterprise. Since 1945 small quantities of cassiterite have been mined along the River Amapari, but the region has hitherto been too inaccessible to permit economic working. Samples from both the Amapari and Araguari zones show over 90 per cent of oxide of tin. The pegmatite yields tantalite and cassiterite in almost equal proportions in some places, in others cassiterite only.

Brazilian production of tin has dropped from 260 tons in 1948, to 180 tons, while imports have practically doubled, totalling 1,359 tons during the first half of 1951. During the same period imports of tinplate have increased to 48,077 tons, from 19,094 during the corresponding months of 1950. As Brazil now requires 100,000 tons of tinplate annually, the national steelworks at Volta Redonda is to increase output to 38,000 tons. During 1951, owing to world shortage, import quotas were allotted exclusively to food manufacturers. Other industries were obliged to use tin mill black sheet and terneplate, neither of which was rationed.

The D.N.P.M. is also investigating the occurrences of chromite, recently discovered at Mazagao, in the Amapá Territory. Other deposits are known to exist in Bahia, Minas Geraes and Goias. The Campo Formosa beds in Bahia—the most important—were partially investigated in 1949, when the visible reserves of the Cascabulho mine were estimated at 300,000 tons and the underground deposits at approximately 4,000,000. An analysis of the ores showed 36.23 per cent chromium oxide, with 17.54 per cent FeO and 10.10 per cent SiO_2. In a neighbouring mine (Pedras Pretas) the ores yielded 34 to 36 per cent Cr_2O_3.

No official information is available regarding the Goias deposits and only one occurrence appears to have been studied in Minas Geraes. This, according to Dr. Octavio Barbosa, is small, with ore of up to 47 per cent Cr_2O_3. Immediately prior to the war Brazil shipped 1,400 tons of chromium ores to Italy and 1,900 to Germany. Exports were then diverted to the United States and reached 7,813 tons in 1943, but fell off when hostilities ceased and are no longer quoted in official statistics.

Water—the Key to South African Industrial Progress

By J. P. LESLIE, B.Sc., F.R.S.A., M.I.C.E., M.(S.A.)I.C.E., M.(S.A.)I.Mech.E.

Among many factors governing the extent of industrial development in South Africa, perhaps the most exacting is the availability of an adequate supply of water. The most important source of water is the Vaal River. In the following article, which appeared in No. 3 of *Optima* a quarterly review published by Anglo American Corporation of South Africa, the author, who is Chief Engineer to the Rand Water Board and who has been associated with the development of the Vaal River for 30 years, discusses the measures taken to conserve this huge, but limited, supply. He shows that, provided proper use is made of the Vaal River, South Africa's industrial progress can continue for many years. In this article, topographical and climatic factors and the first major utilization of the waters of the Vaal River are referred to; the future economic use of this river will form the subject of a subsequent article.

Thales of Miletus held the conviction that nothing comes into being out of nothing, and nothing passes away into nothing. He conceived that there must be a permanent and primary substance, and, as he saw water in the state of vapour, liquid and solid, he concluded that the primary substance or principle is water. Modern national water policy recognizes that water is the one great natural resource essential to the life of plants and animals. The continuous circulation of water over and through the earth, its recapture by the atmosphere and subsequent precipitation perpetuate its continuing recurrence in essentially the same average annual quantities and confirm the dictum of the sage.

NATURE'S HYDROLOGIC CYCLE

The natural laws controlling evaporation, precipitation, percolation, distribution, purification and regeneration are immutable, and nothing that man has done can increase or vary nature's established hydrologic cycle. Nature has thus prescribed for the land in each area its share of precipitation, and South Africa, so richly endowed in other respects, in this is ill-favoured.

The conditions determining the distribution of precipitation have their origin in the energy derived from the sun and the rotation of the earth. The normal, symmetrical meridional circulation of the atmosphere is broken up by friction and other causes, and results in three distinct cells of atmospheric movement.

The location of these cells determines the latitudes of maximum and minimum precipitation: the maximum precipitation occurs in the tropics, but in both hemispheres the zones between latitude 40° to 65° are fairly well supplied with rain. Between these zones and the tropics there is a marked reduction in rainfall associated with a high-pressure belt that encircles the earth and determines the limits of latitude within which most of the arid lands of the earth fall—the Kalahari in South Africa, the arid lands of Australia, the Sahara in North Africa, the Arabian desert in Asia and the deserts of the United States and Mexico.

Local topography (land masses and oceans) influence and produce a complex pattern of rainfall, but the similarity of this pattern in the case of South Africa and Australia is noteworthy. Both these land masses are located on approximately the same latitude, and both have great inland plateaux skirted on the coast by mountain ranges—the Drakensberg in South Africa and the Great Dividing range in Australia. Good average rainfall occurs in the narrow belts between the mountains and the sea, but the catchment areas are small and the steep gradients limit conservation and development. There is in the Union no snowy mountain area such as occurs in the Australian Alps, where the melting snow extends the period of run-off into the dry months and permits of the economic diversion and utilization of the waters of the Snowy river.

The average rainfall over the whole of the Union, in extent 472,000 sq. miles, is just over 17 in. per annum; eight per cent of the area has a rainfall of less than 5 in.; 30 per cent less than 10 in; and 65 per cent less than 20 in. Only 10 per cent has a rainfall in excess of 30 in. Nevertheless, if all this rainfall could be conserved and usefully used, the position would not be so serious as to justify the limitation of development, as has recently been envisaged. Conservation is, however, dependent not only on the annual rainfall, but also on the intensity of rainfall. In South Africa, the major portion of the annual rainfall is precipitated (in thunderstorms) during a few months of the year, and for the remainder of the year the hot, dry air evaporates the water conserved. The absence of deep storage sites, and the heavy silt burden carried by the water, due to heavy run-off over short periods, increase the difficulties and make conservation for longer periods than three years uneconomic and often impossible.

The Australian plateau abutting on the Great Dividing range is drained by a major system of rivers, the Murray and its tributaries, the Darling, the Lochlan and the Murrumbidgee. In South Africa, the inland plateau is drained by a similar system of rivers, the Orange and its major tributaries, the Caledon and the Vaal. This river system contributes one-third of the mean annual run-off of the Union, amounting to about 10,000,000 acre-ft. per annum.

Unfortunately, the Orange River, the biggest river in the Union, cannot at present be exploited economically. The flow of the river varies considerably between maximum and low flow conditions; little storage can be provided, and the comparatively heavy silt burden of the water must reduce the capacity of any storage provided. The river does not abut or an area where industrial development is probable; the future use of the water is possibly best confined to agriculture and irrigation. Schemes have been investigated to divert some of the water into adjoining catchments to rejuvenate the Fish and Sundays River Valleys. It may be possible to conserve some portion of the flow by the construction of a series of barrages.

MOST IMPORTANT RIVER IN THE UNION

The Vaal River, the major tributary of the Orange River, is the most important river in the Union; it will determine the limits of the urban, industrial and mining development of the interior of the Union. This importance stems from its geographical position as the boundary between the Transvaal and the Orange Free State and its juxtaposition to the gold mines and coal mines of the Southern Transvaal and Northern Free State and the diamond mines of Kimberley, which it links with a water highway some 500 miles in length. The Vaal has not been developed for transport purposes, though one of the earliest investigations of its potentialities for this use was made (before the discovery of the Witwatersrand goldfields and following the earlier discovery of the coalfields at Vereeniging) with the object of floating coal downstream to the diamond mines at Kimberley.

The Vaal River rises in the highlands of the Transvaal, and near its source drains the area adjacent to Bethal, Ermelo and Standerton. On the right bank, a narrow strip of the Southern Transvaal, about 50 to 100 miles wide, defined by the Witwatersrand watershed, is drained by a number of small streams of which the Zuikerboschrand, the Klip and the Mooi are the most important. Near the confluence of the Vaal and the Orange, the Hartz and the correctly-named Dry Hartz drain the Western Transvaal.

On the left bank, the Klip, the Wilge, the Valsch, the Vei and the Riet tributaries drain nearly the whole of the Orange Free State between the Vaal and the mountains on the border of Basutoland. The whole basin of the Vaal River has an area of 75,000 sq. miles.

The Vaal River has a flat gradient and provides a number of good storage sites. The earliest exploitation of its water took place near Kimberley; later, a small weir was built at Vereeniging to form a pond for the supply of cooling water to the Victoria Falls and Transvaal Power Company's generating station.

VAAL RIVER BARRAGE NEAR VEREENIGING

The first major utilization of the water of the Vaal River was the completion, in 1923, by the Rand Water Board of the Barrage, about 25 miles below Vereeniging, which submerged the original weir and created a reservoir 40 miles long with an impounding capacity of 13,500 million gallons. This capacity was sufficient to assure a daily abstraction of 20,000,000 gallons per day, which, together with that obtained from boreholes and wells in the Klip River Valley, appeared to provide ample security for the future expansion of the Witwatersrand.

The Union's departure from the gold standard in 1932, provided such an impetus to mining and industrial development in the Witwatersrand area that, in the succeeding 10 years, the daily average consumption of water increased from 17,000,000 gallons to 58,000,000 gallons and compelled the Board to make immediate arrangements to augment the supply of raw water.

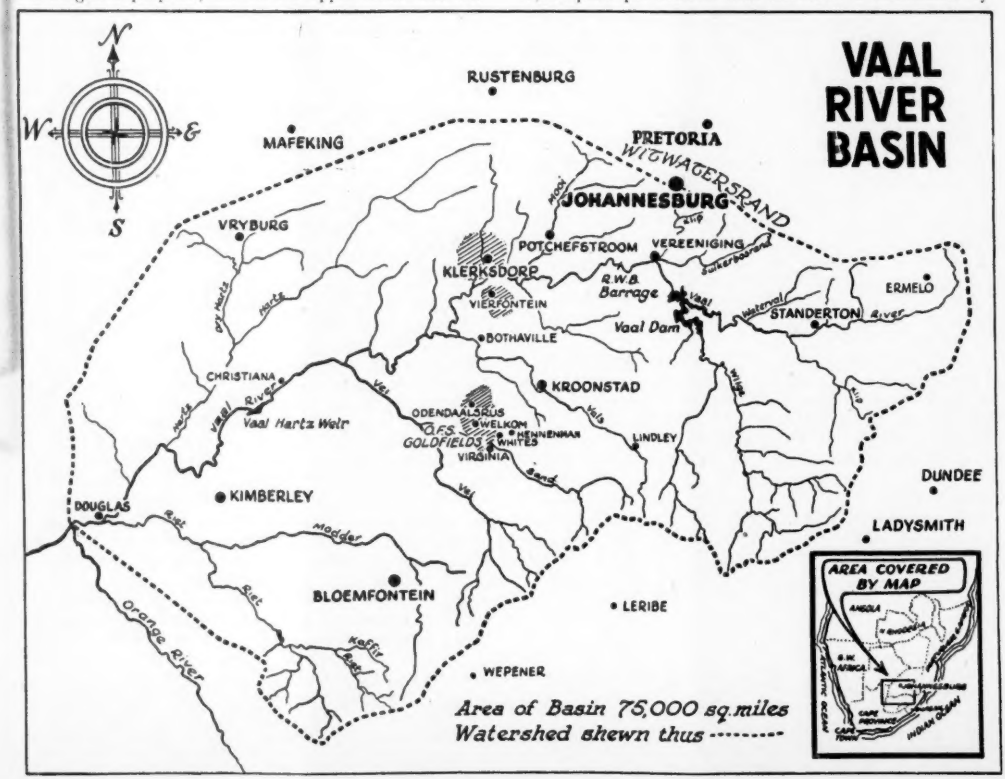
At this time the Government was considering two major schemes for the conservation of water in the Vaal River for irrigation purposes, one on the upper reach near the confluence of the Wilge and the Vaal rivers, and one on the lower reach near Christiana. The upper site had certain economic and technical advantages, and when the Board offered to contribute £240,000 towards the cost of the works for the right to abstract 60,000,000 gallons per day, the Government decided to proceed with the national scheme now known as Vaaldam. Additional abstraction rights were purchased in 1937 and 1944, making a total of 195,000,000 gallons per day, for which the Board has paid the Government just over £1,000,000.

Vaaldam, when full, impounds 234,471 million gallons of water and has a maximum depth above tail water of 100 ft. The water discharged from Vaaldam flows into the reservoir created by the Barrage, maintaining the water level at the Barrage at a depth of 24 ft. All authorized users draw water from the flow, the balance passing through the Barrage for the service of lower riparian owners and for the Vaal-Hartz irrigation works.

The ponding effect of Vaaldam altered the whole character of the river from Villiers down to the junction of the Vaal with the Orange, a distance of 620 miles, and, by controlling the discharge from the dam, converted a river of variable and uncertain flow into a perennial stream.

The catchment of the Vaal above Vaaldam has an area of about 14,700 sq. miles; it excludes the Witwatersrand and Vereeniging areas drained by the Rietspruit, the Klip and Zuikerboschrand tributaries, and is fed almost entirely by surface drainage of rain falling within the catchment area. A small flow is maintained by springs, and the subsoil may contribute a certain quantity.

The Vaal River has always carried a large amount of silt in suspension, the quantity varying from 50 parts to 5,000 parts per million. This condition is determined by



the topography of the basin and the intensity of precipitation, but the amount of silt carried may be increased by those circumstances causing soil erosion. The Government is endeavouring to control erosion, and such measures must influence the silt content. In respect of turbidity, the Vaal River is similar to other large rivers, such as the Nile or the Mississippi, though abnormal compared with most large rivers in Western Europe; it is, however, better than most South African rivers.

The Vaaldam has to some extent altered the character of the water passing the Barrage and has largely smoothed out the variation in turbidity. For the nine years 1928-1937 before Vaaldam was built, nearly 4½ million-million gallons of water passed the Barrage and it carried in suspension 33,500,000 tons of silt, or an average of 7½ tons per 1,000,000 gallons of water. For the six years 1938-1944 after Vaaldam was built, the quantity of water passing the Barrage was practically the same as for the nine-year period, but it carried only 7,500,000 tons, or an average of 1⅞ tons of suspended matter per 1,000,000 gallons of water. It is estimated that the silt deposited in Vaaldam is of the order of 2,500,000 tons per annum and that it would take nearly four hundred years before enough silt had accumulated to fill the Vaaldam reservoir.

The Vaal River water above Vaaldam has a normal hardness of 60 to 70 parts per million and is particularly suitable for industrial purposes. Below Vaaldam, the water brought to the Vaal River by the Zuikerboschrand and Klip rivers, draining the central area of the Witwatersrand, has a seasonal influence on the hardness of the water of the Vaal River, increasing it to as much as 300 parts per million due mainly to the addition of calcium sulphate and, to a minor extent, magnesium salts. The influence of these two tributaries on the quality of the Vaal River water should be considered in any future planning for industrial purposes.

Vaaldam is situated on the upper rim of that great saucer of gold-bearing sedimentary rocks which, outcropping along the Witwatersrand, extends in a wide circle across the Vaal River into the Orange Free State. The rapid development of gold mining on the perimeter must bring in its train an increased population and industrial development similar to that which has taken place adjacent to the Witwatersrand. To serve this area with the water so necessary for its development, Vaaldam is particularly well situated, being of sufficient elevation to feed water to the whole area without creating those pumping problems which have increased the cost of water supplied to the Witwatersrand.

But is there sufficient water in the Vaal River to provide for this future expansion?

The measured flow of the Vaal River at Vereeniging before the construction of Vaaldam and the Barrage fell as low as 1,500,000 gallons per day and has risen as high as 90,000 million gallons per day. Exceptionally high floods have occurred roughly at intervals of 25 years (1866, 1894, 1917, 1944), but it is impossible to store this flood water.

MEASURING THE FLOW

Engineers can determine the character of a river from a mass diagram showing the measured flow of the river plotted in relation to the accumulated gross demand. From this diagram the most economic size of reservoir, the amount of reserve storage required and the maximum sustained draft can be computed. Examination of the mass diagrams of many South African rivers reveals that, due to the long drought periods, the theoretical storage required to regulate the flow to the maximum possible exceeds that obtainable or economically justifiable.

In the case of the Vaal River, comparatively accurate records are available of the flow, though the period (50 years) is too short to cover all possibilities of behaviour; this is a disadvantage that is applicable to all South African rivers, and one that only time can rectify.

Japan's Manganese Ore Potential

In Preliminary Study No. 50 entitled "Iron and Manganese Ore Potential of Japan," issued by the Natural Resources Section, General Headquarters, S.C.A.P., Mr. Charles F. Park, Jr., states that before World War II, Japan produced only small quantities of manganese ore and it was easily and cheaply obtained elsewhere. Production in 1940 was 79,000 tonnes. Imports during the same year aggregated 120,000 tonnes. During the war and under Government stimulus, domestic production reached 360,000 tonnes in 1944, whereas imports dropped to about 40,000 tonnes. During 1950, Japan produced about 126,000 tonnes of ore averaging 37 per cent manganese and imported 40,000 tonnes averaging 44 per cent manganese. Steel companies hope to import more than 150,000 tonnes of ore this year.

TWO TYPES OF DEPOSITS

The manganese deposits of Japan are of two types—siliceous and carbonate. Siliceous manganese-ore deposits are distributed widely throughout the four main islands of Japan. They are small and for the most part low-grade, containing 30 to 40 per cent manganese. Production from individual deposits does not exceed a few hundred tons a month. During World War II about 1,200 mines were operated, with a maximum production of more than 400,000 tonnes a year. During 1950, more than 150 such mines operated at least part time, the total production amounting to about 100,000 tonnes. This production was attained during a period when the controlled price was very low and appreciably less than was paid for the same grade of imported ore. The easing of price control has resulted in increased production.

The siliceous ore bodies are veins and beds, which are irregular in form and in composition. Four groups of minerals are found: (*a*) Manganese sulphide, (*b*) incidental manganese carbonates, (*c*) manganese oxides, and (*d*) manganese silicates. The first three groups are ores, but the grade decreases as the quantity of manganese silicates increases, and the silicates alone seldom constitute ore. The composition of the veins grades rapidly in every direction from ore through marginal ore to waste. The deposits likewise are lenticular, and they pinch and swell abruptly. As a result of the character of the ore bodies, mining is highly selective, and is done entirely by hand. The deposits can only be worked by abundant and cheap manual labour; they are not amenable to exploitation by mechanical methods.

Very little or no geologic mapping has been done around these siliceous deposits, and most owners do not have enough capital to hire capable technical men.

In deposits of this kind, no statement of ore reserves is possible. As soon as an ore body is found, it is mined. If the operators have a reasonable incentive, these mines will continue at their present rate of production for many years; an increase in price would be reflected by an increased output. The development of the mines involves only a small capital outlay and generally is done by individuals or small groups.

Good examples of siliceous manganese deposits are found in the Noda Tamagawa mine, Iwate Prefecture; the Kinko mine, Yamaguchi Prefecture; the Nagashima mine, Gifu Prefecture, and the Tokaga mine, Kyoto Prefecture.

The two largest carbonate manganese mines in Japan are the Inakuraiski and Jokoku, both in south-western Hokkaido. During 1950, they produced 21,777 tonnes of roasted manganese carbonate, which contained 40 to 44 per cent manganese.

This year, the total production is expected to reach 35,000 tonnes. The ores are in well-defined vein systems and contain on the average about 30 per cent of manganese. The grade is raised above 40 per cent by hand picking and by roasting in primitive furnaces. Known and probable reserves total about 300,000 tonnes, although potential reserves are much larger.

JOKOKU MINE'S EXPLORATION PLAN

The Jokoku mine has employed a geologist since January, 1951. The company has ordered a diamond-drill rig and expects to begin exploration for new ore in the very near future. No geological work has been done at the Inakuraiski mine, and exploration is both haphazard and expensive. Much of the ore at both mines contains recoverable lead and zinc—elements that are detrimental in manganese ore. Under the present system of treatment many of these impurities remain in the ore. The existing ore reserves are not enough to justify installation of modern plants at either mine. Intensive geological studies and exploration programmes are needed and have good chances of developing large ore reserves. By modern flotation and nodulizing processes, ores of the type at Inakuraishi and Jokoku can be upgraded to about 50 per cent manganese, and the lead and zinc can be recovered and sold. The waste rock, rejected at the present time, contains about 15 per cent manganese.

The following is a description of the mines mentioned above:

Noda Tamagawa Mine, Iwate Prefecture: The Noda Tamagawa mine of the Shinkogyo Kaihatsu Co. produces about 200 tonnes of manganese ore a month (44 to 45 per cent manganese). This ore is sold to the Tekkosha Co. and is used in the manufacture of ferromanganese. The ore contains 22 to 23 per cent quartz. No estimate of reserves has been made. The mine is operated through an adit and ore mined comes from above this adit level. No effort has been made to develop deeper ore. The mine probably can operate at its present scale for many years of its product can be sold at a reasonable price.

Kinko Mine, Yamaguchi Prefecture: The Kinko mine owned by the Furujuku Mining Co. produces about 35 tons of complex manganese ore a month. The grade averages between 25 to 40 per cent manganese; silicates, carbonates, and oxides were noted in the material. Virtually no reserves are maintained; the ore is removed as rapidly as it is discovered. The deposit appears to be interlayered in chert and follows in detail the contortions of the chert beds. The ore layer is up to two metres thick. The mine is operated on marginal ore, and no effort is wasted on non-essential work. The first principle in this type of operation is to stay with the ore. The Japanese understand this very well and operate this property efficiently.

Nagashima Mine, Gifu Prefecture: The Nagashima mine of the Ogawa Mining Co. is one of the largest siliceous manganese mines in Japan. Production averages about 260 tonnes of a grade ranging from 30 to 40 per cent manganese. The ore is a complex silicate, oxide, and carbonate, with minor quantities of sulphide. The ore layers are in chert with some altered basic volcanic rocks on the footwalls. At least three different deposits are worked. The ore is hand-sorted and is transported to a truck road by an aerial tramway. All mining is by hand, although small tram cars are used to transport the ore to the surface. The miners stay with the ore and, as a result, the workings resemble a series of irregular gopher holes.

Tokaga Mine, Kyoto Prefecture: The Tokaga mine, operated by the Sampai Mining Co., produces about 100 tons of manganese a month. The product sold is hand-sorted, and the grade ranges from 25 to 45 per cent manganese.

Inakuraishi Mine, Hokkaido: The Inakuraishi mine produces about 1,500 tonnes of crude manganese ore a month. The reserves are said to include about 10,000 tonnes of proved ore and about 100,000 tonnes of possible and probable ore reserves. The grade averages about 30 per cent manganese, 17 per cent silica, 4 to 5 per cent iron, and small quantities of lead, zinc, copper, gold, and silver. The ore is used by the Tekkosha Co., owners of the mine, in the manufacture of ferromanganese. Three vein systems, the Mansei, Kinsei, and Okuninakuraishi, have been operated in the past, but at present only the first two are being worked. About 50 tonnes of ore are mined a day from the Mansei system and about 20 tonnes from the Kinsei system. No geological mapping has been done at the mine nor is any contemplated in the near future. The Japanese Geological Survey has been asked by the company to map the surface around the mine, but the Survey will not do any detailed underground mapping such as is necessary. The company owns an old diamond drill, and a small amount of undirected drilling has been done. However, a careful study would lead to the discovery of additional ore. Mining methods are somewhat haphazard, but in general overhand stoping, with jackhammers and stopers, is used. The stopes are left open and seem to stand well. The ore is dropped through chutes to the lowest level and is hand-trimmed to the surface. No mechanical equipment other than air drills is used.

ROASTING CONCENTRATES

Wall rock is hand-picked from the ore underground, the ore is passed through a 6 in. grizzly, the oversize is broken to a 2 in. maximum, and the ore is hand-sorted to remove wall rock and sulphides. The concentrates are passed over a ⅝-in. vibrating screen; the fines are then ready for roasting. The oversize is again hand sorted after washing. The ore concentrates are roasted in 14 shaft furnaces, each with a capacity of three tonnes per eight-hour shift. The roasting removes carbon dioxide and sulphur and raises the grade of the concentrates about 10 per cent. Fifty kilogrammes of coal are required for each tonne of ore roasted. Charging and discharging the furnaces are done entirely by hand.

Jokoku Mine, Hokkaido: The Jokoku mine of the Chugai Mining Co. produces about 1,700 tonnes of crude ore or about 1,200 tonnes of concentrates a month. The company reported reserves as 16,600 tonnes of proved, 171,000 tonnes of probable, and 616,000 tonnes of possible ore. Judging from the maps and methods of calculation, these estimates, which were made by the chief mining engineer, appear to be reliable. All exploration has been done by driving long, expensive drifts and crosscuts; no diamond drilling has been done. The company has ordered a drill rig and plans to start an exploration programme as soon as the equipment is received. Stoping is done with stopers and jackhammers, and shrinkage methods are used.

The present mill contains an old jaw crusher, a short picking belt, and several wood-burning roasting furnaces. The grade of the ore is raised above 40 per cent manganese by the combined picking and roasting. A new mill and aerial tramway are now under construction and were expected to be in operation in September of this year. The new mill, which is designed to handle 350 tonnes per day, involves crushing, hand picking, and roasting in a special furnace, designed by the mine manager.

Machinery & Equipment

New Fordson Major Tractor

In spite of rising prices, the Ford Motor Company, Ltd., Dagenham, in introducing an entirely new range of Fordson Major Tractors, has succeeded in reducing the price of the fully equipped Diesel-engined model by no less than £109 5s. This is stated to have been achieved largely by the design of three completely new engines—petrol, vaporizing oil and Diesel—in which many basic common components are used, thus considerably cutting manufacturing costs. No sacrifice of quality is involved in this standardization as all the common parts are designed to the highest specifications required in any of the alternative engines.

All three alternative engines have four cylinders and overhead valves. They are powerful, robust and yet remarkably economical in the use of fuel. Simplicity of service is another great advantage in the standardization of component parts. Power is transmitted by a single dry plate clutch; a new transmission with six forward and two reverse gears makes it possible to carry out all jobs at the correct speed. The completely redesigned hydraulic lift is operated by a gear-type pump. The whole system, together with the linkage, is designed for long and trouble-free life and is extremely simple.

Ease of operation is a big point in all aspects of the new Major. Everything from the hydraulic power lift to the reserve fuel supply is controlled from the seat, and controls are grouped as in a car, with clutch pedal on the left and brake pedal on the right. The deep pan seat, cushioned by a shock absorber, can be tipped forward when not in use and the driver has an unimpeded view.

Hydraulic-Controlled Braydozer for Fordson Major

Exclusively designed for operation with the new Fordson Major is the new Hydraulic-controlled Braydozer, built by W. E. Bray & Co., Ltd., Feltham, Middx, which makes full use of the tractor power. Controlled from the standard

The new Fordson Major fitted with the hydraulic-controlled Braydozer

hydraulic power lift, this equipment is claimed to stand up to hard wear and to be capable of handling large capacities in a comparatively short time at low cost working potential.

New and improved features of this Braydozer include: extra wide blade with reversible cutting edge—designed to roll the spoil; the main frame, of reinforced boxed channel section, is pivoted from the drawbar pick-up bracket; all thrust is taken up on parts designed for the purpose, and finger-tip hydraulic control with three operating positions—"Up, Hold, and Down."

Abridged specifications are:

Dimensions: 6 ft. long, 2 ft. high, cutting edge section 4 in. x ⅜ in. x 6 ft. long. Reversible. Moldboard lifts above ground 11½ in. and digs 5½ in. Simple pin adjustment enabling unit to operate as bulldozer or left or right angledozer.

Main frame: reinforced box channel section, fitted with rollers to reduce friction from angledozing side thrust.

Hydraulic Equipment: Single lever hydraulic power lift. Three operating positions.

Weight (*approx.*): 560 lb.

Nife Self-Service Miners' Caplamp System

The recently re-designed Nife alkaline battery-powered miners' caplamps and their now established system of controlled self-service in colliery lamp rooms are described in a new publication (No. 4451), issued by Nife Batteries, Redditch, Worcs. The object of these innovations was to ensure the utmost simplicity and reliability in the lamp, the minimum of lamp room staff and the maximum of smooth, efficient service.

The new system, which is stated to be working very satisfactorily at many important collieries, is based fundamentally on the robust Nife steel-alkaline tubular positive batteries. The makers claim that even under the most arduous conditions, these batteries often possess a working life as much as ten times longer than other types. No provision need be made on site, therefore, for re-plating or repairs, and routine battery testing, a characteristic of systems based on a short life battery, is no longer necessary. Moreover, the new headpiece, produced in featherweight toughened plastic, has many fewer components, and the electrical circuit in which pure silver contact points are used to minimize voltage drop, has become much simpler.

The combined "Perspex" bezel and lens are described as a particularly interesting feature of the lamp. This one piece, almost unbreakable moulding replaces three components in a headpiece of orthodox design, reduces glare and is said to provide a ten per cent increase in mean spherical candle power.

The Nife controlled self-service system automatically ensures a clear division of responsibility between the miner and lamp room staff. It is built around an inner charging and servicing room inside the lamp room proper, the side walls of the inner room consisting of open-ended and individually numbered lamp cubicles. The miners enter, through a turnstile, the corridor formed between the lamp room wall and the honeycombed wall of the charging and servicing room, and, in passing through to the baths, they simply place their lamps in their own numbered cubicles. The lamp room staff then draw the lamps from the inner side, open them and place the batteries on the charge racks behind them. When fully charged, the lamps are inspected before being closed and replaced in their respective cubicles for withdrawal from the outside by the miners returning on shift. A tally counter hanging from the roof of each cubicle automatically shows whether a lamp requires charging or is ready for service.

Like the batteries, the charge racks are constructed in steel. According to the company, they ensure full control of charging with adequate provision for making any variations that may be desirable. Each accommodates eighty batteries in four circuits of twenty. Current is supplied by a full-wave, bridge connected selenium metal rectifier complete with a double-wound vacuum-impregnated transformer. Control is by means of a triple-pole mains switch.

Metals, Minerals and Alloys

The C.I.O. United Steel Workers have formulated their demands on the steel producing companies and negotiations are now in progress. Of the 22 demands which are said to have been presented the most important is a pay increase of 30c. an hour on the present average of $1.95. Present contracts terminate on December 31 so that the great steel industry has one month in which to reach agreement with the men or face a general steel strike.

Copper.—Perhaps the most interesting development with regard to this metal is a statement by Mr. Fleischmann that the U.S. is not getting its share of the I.M.C. fourth quarter allocations, and that unless the situation improves they may have to enter the world copper market and outbid other countries for the red metal. It was expected that the matter would be discussed at the meeting of the N.P.A. and the Copper Producers' Advisory Committee towards the end of last week. Mr. Fleischmann further stated that defence requirements may preclude the provision of any copper for civilian uses with the commencement of the second quarter of next year; first quarter allocations were reasonably safe.

The negotiations between the Chilean Government and the Anaconda, Andes and Kennecott Companies, which have been proceeding for a considerable time, have now resulted in a draft contract which only requires the ratification of Congress for its completion. One of the chief points is the regulation of exchange: at present the companies must sell their dollars at the rate of P.19.32 to the U.S. dollar. Under the agreement the companies will be given P.90 to the dollar. As a set off Income Tax payable in Chile will be raised from 50 per cent of profits to 67.3 per cent. The addition to the tax of 17.3 per cent will be reduced as the companies increase their output from the agreed figure of 168,750 s.tons for Chile Exploration (Chuquicamata) and Kennicott (Braden) and 55,000 s.tons for Andes (Potrerillos). The companies have agreed to invest additional capital in Chile in order to increase output and undertake not to participate in the formation of cartels that may fix a ceiling price for metal without the Chilean Government's approval. The contract when ratified will be for 15 years.

Primary copper producers in the U.S. continue to challenge statements by Government officials that the country will always be short of copper and they believe that the supply may be relatively better than that of aluminium in two or three years. The familiar phrase is again being used that within two years they would be wondering what to do with the available copper; as a corollary of this belief they are urging the Government to withdraw its propaganda for the substitution of other materials for copper pointing out that if other metals are substituted consumers will probably continue their use. Incidentally, the U.S. Chamber of Commerce have declared that price and wage controls should be abolished immediately in the public interest.

The N.P.A. has estimated total available supplies of primary copper for the current year at 1,609,000 s.tons (1,747,000 last year). The estimate comprises 933,000 s.tons of domestic refined, 259,000 tons from foreign ores imported, 229,000 tons imports of metal, 133,000 tons from copper scrap, and stockpile withdrawals 55,000 tons. Domestic production for next year is estimated at 1,005,000 s.tons.

Another agreement providing a floor for future prices this time with the A.S. & R. has been announced by the Defence Materials Procurement Administration. This affects the Silver Bell Mine in Pima County, Arizona, which it is hoped will start production within two years and produce at the rate of 18,113 s.tons for about twelve years. The Government will purchase if required over a 5½ year period up to 88,500 s.tons at 24½c. f.o.b.

It is reported from Nicosia that copper concentrates exported from Cyprus for the first three quarters of the current year totalled 77,000 tons against 103,000 tons for the whole of last year. Most of the exports went to Germany, Italy, Netherlands and the U.S.A.

Lead.—U.S. December lead allocations were given out last week and despite the fact that they include some of the 30,000 s.tons withdrawn from stockpile, applications were four times in excess of actual allocations.

Foreign demand is said to be slackening for Mexican lead where it is feared that a long term downward tendency of prices is developing. The extent to which the trade has been deflected from the U.S. to Europe is shown by a statement of the National Bank in Mexico City. June exports entirely to the U.S. were 19,452 tonnes. This had fallen in August to 4,691 tonnes out of a total export for the month of 12,841 tonnes. So far sellers have refused to consider any bids under 21½c. for bulk sales. There are some European enquiries for early 1952 shipment at prices under the current quotation.

U.S. production of refined lead in October was 34,273 s.tons (30,474 in September), but shipments declined to 31,164 s.tons (31,654 in September); total production for the ten months is reported as 413,886 s.tons (472,804 for the same period last year). The strike at the Herculaneum Smelter still continues with an estimated loss of 7,500 s.tons. New composite metals involving the use of lead have been announced by Knapp Mills Inc. of Long Island. The first has been christened Ferroleum, made by bonding lead and steel yielding a product resistant to sulphuric acid. The second is cupralum which is the bonding of lead and copper. These products are specially designed for use in the nuclear industries to prevent harmful radiation, while cupralum is proving its value in heating and cooling of sulphuric acid, and for the manufacture of anodes.

Tin.—With no assurance of an early change in the U.S. policy of abstention from tin buying prices have continued to decline. Mr. Fleischmann, the N.P.A. administrator, stated last week that he supported the R.F.C. position in relation to tin purchases as it was inequitable that the country should not get its metal at a fair price. He also told a Press conference that tin conservation measures were essential.

General Wilson is reported in conversations in Malaya to have repeated the formula addressed to the Bolivians: tin at our price. Mr. Stuart Symington, too, has repeated his well-known views.

Anxiety seems to be spreading as the concentrate contracts with the R.F.C. approach the date of completion at the end of the year and M. André Dequae, the Belgian Colonial Minister, is reported as having said recently that tin was the only cloud, and a rather dark one, on U.S.-Belgian relations. He expressed the hope that the report of the American Mission to Malaya might induce the U.S. Government to resume negotiations and offer an equitable price. The U.S. Tin Mission now in Indonesia is expected to return home about the end of the week.

The Colonial Secretary, Mr. Oliver Lyttelton, has been travelling around Malaya and receiving many deputations. He is insistent that the immediate problem is beating the Communists before embarking on political and constitutional issues and he thought that security conditions might become worse before they got better.

Straits shipments in November were 6,073 tons: Europe 2,861, U.K. 1,688, British possessions 753, elsewhere 771 tons.

Zinc.—December zinc allocations in the U.S. were considered adequate to meet the restricted rate of consumption and were slightly higher than in November. While the U.S. ceiling price remains at 19.5c. Mexican zinc continues firm at around 29/31c. f.a.s. gulf. This big premium over U.S. prices has been responsible for an almost total cessation of exports to the U.S. Whereas in June of last year all Mexican exports went to the U.S. in August last less than 1 per cent of the refined zinc exports were shipped there. The principal buyers of Mexican zinc in order of importance are stated to be Pakistan, Belgium, Britain and the Netherlands.

Aluminium.—The Kaiser Aluminum & Chemical Co. is to consider an enlarged programme of financing estimated to run to $100,000,000 to double the company's New Orleans plant for which an agreement has been reached with the U.S. Government The capacity of the plant will now be 200,000 tons of primary aluminium yearly. United States output in September reflected a curtailment of power supply with a total of 69,429 s.tons (72,815 in August). None the less production every month this year has been considerably in excess of the corresponding period in 1950.

The London Metal Market

(From Our Metal Exchange Correspondent)

Owing to lessening interest from consumers the market has drifted steadily downwards and it is expected that this tendency will continue until after the Christmas holidays unless there is any dramatic alteration in the political situation.

The backwardation again shows signs of increasing, probably due to the "go slow" movement in the London Docks which is causing considerable delay in the warehousing of tin arrivals.

In America on Tuesday, Mr. Symington once more uttered his well-known sentiment that his country will remain out of the tin market until the price is considered by them to be reasonable. This policy is now attracting more and more opposition as manufacturers realize that their supplies of metal are being curtailed while there is an overall surplus of production in the world, and also the more deeply thinking Americans are beginning to ask what effect the policy is going to have on the native populations in Malaya and Indonesia, and find difficulty in squaring it up with President Truman's Point Four for the assistance of backward areas.

On Thursday the official close on the tin market was: — Settlement price £935, Cash Buyers £932 10s., Sellers £935; Three months' Buyers £915, Sellers £917 10s. In the afternoon the market was steady. Turnover for the day was 140 tons. Approximate turnover for the week was 860 tons.

The Eastern price on Thursday morning was equivalent to £903 12s. 6d. per ton, c.i.f. Europe.

Iron and Steel

If further evidence were needed to emphasize the precarious position of the steel makers in regard to supplies of raw materials it is provided by the news that ten of the 27 open hearth steel furnaces in West Wales are to be closed down next week because of the acute shortage of pig iron. This closure will mean the loss of 5,000 tons of ingots scheduled for distribution to the local tinplate works. It is hoped that the stoppage will not extend beyond the end of next week. Two cargoes of European pig iron are expected to relieve the position and restore all the furnaces to full operation in the week before Christmas.

The possibility of other interruptions of a similar character cannot be excluded. More scrap, iron ore and pig iron are numbered amongst the most urgent of our national needs. Scrap is as scarce as ever, and imports are now running at the rate of about 500,000 tons per annum compared with nearly 2,000,000 tons last year.

Ore supplies are more plentiful, but Mediterranean shippers are experiencing difficulty in chartering suitable carriers, and until ampler tonnages are available the planned expansion of pig iron production must be held up.

Upon an otherwise bleak horizon for the steel industry there is one brighter gleam. It is announced that the U.K. has received authority to place orders in the U.S. for 93,000 tons of ingot and has been allocated 25,000 tons of finished steel for the first quarter of 1952. These are relatively small tonnages in comparison with the 800,000 tons which were sought by Mr. Gaitskell during his visit to Washington, but it is understood that negotiations on this subject are still continuing, and a more favourable atmosphere having developed, the outlook in this respect is described as distinctly more hopeful.

DECEMBER 6 PRICES

COPPER

Electrolytic	£227 0 0 d/d
Fire refined, high conductivity	£227 0 0 d/d
Fire refined, high grade	£226 10 0 d/d
Fire refined, ordinary quality + 99.7%	£226 0 0 d/d
Fire refined, ordinary quality + 99.2%	£225 10 0 d/d

TIN

(See our London Metal Exchange report for Thursday's prices)

LEAD

Soft foreign, duty paid	£175 0 0 d/d
Soft empire, including secondary lead	£175 0 0 d/d
English lead	£176 10 0 d/d

ZINC

G.O.B. spelter, foreign, duty paid	£190 0 0 d/d
G.O.B. spelter, domestic	£190 0 0 d/d
Prime Western	£190 0 0 d/d
Electrolytic and refined zinc	£194 0 0 d/d
Zinc (99.99% Zn)	£196 0 0 d/d
Sheets	£210 10 0 ex works
Zinc oxide (red seal)	£205 0 0 d/d
Zinc oxide (green seal)	£206 10 0 d/d
Zinc oxide (white seal)	£207 10 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over	£365 per ton
Crude (70%)	£290 per ton
Ore (60% basis)	45/50s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade)	£454 per ton

OTHER METALS

Aluminium, £124 per ton.	Palladium, £8 10s. oz.
Bismuth, 28s. lb.	Platinum (scrap), £33.
Cadmium, 18s. 9d. lb.	Platinum, £27/£33 5s. nom.
Chromium, 6s. 3d. lb.	Rhodium, £45 oz.
Cobalt, 17s. 6d. lb.	Ruthenium, £30 oz.
Gold, 248s. f.oz.	Quicksilver, £73 10s./£74 ex-warehouse.
Iridium, £65 oz. nom.	Selenium, 25s. nom. per lb.
Magnesium, 1s. 6d. - 2s. lb. according to quantity.	Silver (bar), 77d. f.oz. spot and forward.
Osmiridium, £35 oz. nom.	Tellurium, 19s. lb.
Osmium, £70 oz. nom.	

ORES, ALLOYS, ETC.

Bismuth	40% 14s. 9d. lb. c.i.f. 30% 12s. 9d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (lumpy)	£13 per ton c.i.f.
" " (concentrates)	£13 per ton c.i.f.
" " Refractory	£12 12s. per ton c.i.f.
Baluchistan Metallurgical	£13 18s. 6d. per ton c.i.f.
Magnesite, ground calcined	£26 - £27 d/d
Magnesite, Raw	£10 - £11 d/d
Manganese, Best Indian	(Nominal)
Molybdenite (85% basis)	103s. 1¼d. per unit c.i.f.
Wolfram (65%), U.K.	515/525s. nom. c.i.f.
Tungsten Metal Powder (for steel manufacture)	35s. nom. per lb. (home)
Ferro-tungsten	33s. nom. per lb. (home)
Carbide, 4-cwt. lots	£30 3s. 9d. d/d per ton
Ferro-manganese, home	£40 12s. 8d. per ton
Ferro-manganese, export	Nom.
Brass Wire	2s. 7¼d. per lb. basis.
Brass Tubes, solid drawn	2s. 1d. per lb. basis.

The Mining Markets

(By Our Stock Exchange Correspondent)

Conditions in stock markets this week have been rather dull. Business "Markings" have been running about the 7,000 mark. Government stocks have continued downwards following small sales and an absence of buyers. During November over £36,500,000 of new money was raised and more issues are pending. In to-day's uncertain conditions many institutional underwriters are thought to be selling gilt-edged holdings for the purpose of finding the money to cover their commitments. The critical Egyptian situation has also exerted a depressing influence over the whole market.

Kaffirs have had a poor week. Market estimates of December dividend are not very cheerful. Few increases are expected and several cuts anticipated in the distributions of leading producers. In this connection, Brakpan, Geduld, Randfontein and Sub Nigel are among those mentioned. Developing mines have suffered a severe shake-out. The November Rand returns contained the first month's operating figures for St. Helena and Welkom. The former company records a loss of £35,778 and working costs at 49s. 8d. per ton; the latter, a loss of £64,402, no working costs being given. St. Helena report that these figures include a provision of 20s. per ton for development, and that they were adversely affected by the high proportion of development rock milled, and by the absorption of gold in the reduction plant. Progress in underground development has been slow owing to faulting and water. Welkom point out that the 30,000 tons milled was drawn almost entirely from development rock. Losses of such magnitude, coupled with the intimation by St. Helena that further finance would be needed at some future date, depressed the market. It should be remembered however, that results can hardly be expected to show up well in any developing mine during the "running in" stage. Once "saturation" point has been reached in the new milling plants gold absorption can be expected to disappear, and as increased stopes become available the plant will no doubt be expanded.

Cam & Motor, the Rhodesian mine, are paying a final dividend of 18 per cent making 36 per cent for the year as against 30 per cent last year. The full report issued this week will make satisfactory reading for shareholders. Some time ago many market men thought that the life of the mine could not continue many years, owing to greatly increased costs and falling reserves. Devaluation gave this property a new lease of life and recent developments as outlined in the report present a much more cheerful picture.

In the Australian gold section North Kalgurli relapsed on further consideration of the report.

Eastern tin shares were fractionally better over the week. The visit of Mr. Lyttelton to Malaya has caused hopes that stronger action will shortly be taken against bandits.

Lead/zinc issues were mostly easier. The Mount Isa chairman stated that the outlay last year on the new copper plant was £1,225,239 and that this could not be completed before mid-1952.

Among diamond shares Anglo-American Trust jumped due to a large buying order which is reported to have caught the market short of stocks. Casts eased following the fall in earnings from 130 per cent to 113½ per cent. The dividend was maintained at 100 per cent. The chairman reports labour unrest and illicit mining in Sierra Leone, but maintains that the current outlook is satisfactory.

Oils were firm in contrast to most other sections. Shell Transport have attracted buyers as a "lock-up" investment, and Trinidad Leaseholds rose after being quoted ex-dividend.

FINANCE	Price Dec. 5	+ or − on week
African & European	3¼	+ ⅛
Anglo American Corpn.	7⅜	
Anglo-French	22/3	−3d
Anglo Transvaal Consol.	38/9	
Camp Bird	12/3	+3d
Central Mining (£1 shrs.)	40/7½	
Consolidated Goldfields	47/6	+1/3
Consol. Mines Selection	32/6	−7½d
East Rand Consols	3/6	
General Mining	5½	− ⅛
H.E. Prop.	36/3	
Henderson's Transvaal	13/6	−3d
Johnnies	3½	+ ⅛
Rand Mines	6⅝	
Rand Selection	43/9	+7½d
Union Corporation	9⅛	− ⅛
Vereeniging Estates	5⅛	− ⅛
Wits.	34/4½	+1/3
West Wits.	43/9	+7½d
RAND GOLD		
Blyvoors	45/-	
Brakpan	18/-	
City Deep	2⅛	+ ⅛
Consol. Main Reef	2⅛	− ⅛
Crown	4½	+ ⅛
Daggas	3⅛	+ ⅛
Dominion Reefs	27½	+6d
Doornfontein	24/-	+10½d
Durban Deep	3⅛	− ⅛
E. Daggas	24/4½	−7½d
E. Geduld ... (4/- units)	50/-	−7½d
E. Rand Props.	4	
Geduld	7½	
Grootvlei	36/10½	−4½d
Libanon	15/-	
Luipaards Vlei	20/-	−3d
Marievale	23/9	+9d
Modderfontein B.	4/9	−3d
Modderfontein East	31/3	−1/3
New Kleinfontein	31/3	+7½d
New Pioneer	18/9	
Randfontein	17/3	+3d
Robinson Deep	14/-	−3d
Rose Deep	35/-	+1/3
Simmer & Jack	6/3	−1½d
Springs	8/9	−3d
Sub Nigel	3½	
Van Dyk	14/-	
Venterspost	27/-	+3d
Vlakfontein	17/6	+3d
Vogelstruisbult	28/6	+3d
West Driefontein	6½	
W. Rand Consolidated	46/3	+3/1½
Western Reefs	42/6	−7½d
O.F.S.		
Alpha F.S.A.	8/9	
Blinkpoort	20/-	
Central Mining F.S.	4/6	
Freddies	9/9	−3d
Freddies N.	10/3	
Freddies S.	10/3	
F.S. Geduld	3½	− ⅛
Geduld	20/9	
Harmony	24/-	
Lydenburg Estates	10/-	+7½d
Middle Wits.	20/6	−3d
Ofsits	41/3	−1/3
President Brand	18/-	−9d
President Steyn	17/-	−6d
St. Helena	23/-	−2/-
U.F.S.C. & G.	8/3	−3d
Virginia Deb.	76	
Virginia Ord.	11/1½	−1½d
Welkom	34/4½	−7½d
Western Holdings	3⅛	− ⅛
WEST AFRICAN GOLD		
Amalgamated Banket	2/1½	+1½d
Ariston	6/9	−1½d
Ashanti	27/-	−3d
Bibiani	9/-	
Bremang	3/-	
G.C. Main Reef	3/6	
G.C. Selection Trust	8/-	
Konongo	3/7½	+1½d
Kwahu	4/9	+3d
London & African Mng.	2/-	+1½d
Lyndhurst Deep	1/7½	+1½d
Marlu	1/10½	
Nanwa	7½d	
Taquah & Abosso	7/-	
AUSTRALIAN GOLD		
Boulder Perseverance	3/-	
Gold Mines of Kalgoorlie	13/-	
Great Boulder Prop.	7/3	−3d
Great Western Consol.	6/6	
Lake View and Star	19/9	
Mount Morgan	18/9	−6d
North Kalgurli	16/-	−1/-
Paringa	9d	
Sons of Gwalia	12/-	
South Kalgurli	8/6	
Western Mining	8/1½	−4½d
Wiluna	13/-	−6d
MISCELLANEOUS GOLD		
Cam and Motor	40/7½	+7½d
Champion Reef	9/-	+3d
Falcon Mines	9/6	
Globe & Phoenix	25/-	
MISCELLANEOUS GOLD (contd)		
G.F. Rhodesian	7/9	
London & Rhodesian	6/4½	−1½d
Motapa	2/6	
Mysore	5/6	+3d
New Guinea	1/7½	
Nundvdroog	7/-	+6d
Ooregum	3/3	+1½d
Grovilla	13/9	−3d
St. John d'El Rey	39/4½	
Zams	37/6	−1/-
DIAMONDS		
Anglo American Inv.	5½	+ ⅛
Casts	36/6	−6d
Cons. Diam. of S.W.A.	4⅛	− ⅛
De Beers Defd. Bearer	69/9	+3d
De Beers Pfd. Bearer	16¼	− ¼
COPPER		
Chartered	69/-	+6d
Indian Copper	3/4½	−1½d
Messina	5 5/16	+ ⅛
Nchanga	7¼	+ ⅛
Rhod. Anglo-American	66/9	+2/3
Rhodesian Selection	19/-	−6d
Rhokana	23½	+ ⅛
Rio Tinto	22	+ ¼
Roan Antelope	14/-	
Selection Trust	45/9	−6d
Tanks	57/9	+3d
Tharsis Sulphur Br.	52/6	−1/3
TIN (Eastern)		
Anglo-Burma	3/-	
Ayer Hitam	27/6	−1/3
Bangrin	35/3	+3d
Geevor	16/1½xd	+6d
Hongkong	10/3	
Ipoh	26/3	−7½d
Kamunting	12/10½	+3d
Kepong Dredging	13/-	+1½d
Kinta Tin Mines	16/3	
Kramat Pulai	4/3	
Malayan Dredging	22/3	
Pahang	16/1½	+6d
Pengkalen	11/4½xd	+3d
Petaling	14/6	+1½d
Rambutan	16/10½	
Siamese Tin	23/6	+1½d
Southern Kinta	16/3	+6d
S. Malavan	27/3	+9d
S. Tronoh	21/9	
Sungei Kinta	21/3	−3d
Tekka Taiping	10/-	
Tronoh	29/4½	+4½d
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	10/6xd	−1½d
Beralt Tin	23/1½	
Bisichi	4/4½	+3d
British Tin Inv.	17/6	+3d
Ex-Lands Nigeria	6/4½xd	−4½d
Geevor Tin	15/1½	−1½d
Gold & Base Metal	4/4½	
Jantar Nigeria	7/3xd	−9d
Jos Tin Area	11/6	
Kaduna Prospectors	4/-	
Kaduna Syndicate	5/7½	
London Tin	6/-	−1½d
Ribon Valley	1/1½	−1½d
United Tin	3/1½	
SILVER, LEAD, ZINC		
Broken Hill South	53/1½	−1/3
Burma Corporation	4/-	−4½d
Consol. Zinc	32/9	−1/6
Lake George	23/3	
Mount Isa	46/9	−9d
New Broken Hill	28/6	−1/6
North Broken Hill	71/3	−2/-
Rhodesian Broken Hill	19/7½	−3d
San Francisco Mines	30/-	−1/-
Trepca	3/7½	
MISCELLANEOUS BASE METALS & COAL		
Amal. Collieries of S.A.	56/3	
Associated Manganese	60/-	−1/-
Chinese Engineering	3/-	+3d
C.P. Manganese	47/-	+1½d
Natal Navigation	5½	
Wankie	22/9	+3d
Witbank Colliery	3⅞	− ⅛
CANADIAN MINES		
Dome	$32½	− ½
Hudson Bay Mining	$116	−2
International Nickel	$84	+1½
Mining Corpn. of Canada	£6[illegible]xd	− ½
Noranda	$145	+10
Quemont	£8½	− ½
OIL		
Anglo-Iranian	5⅝	− ⅛
Apex	50/7½	+1/3
Attock	21/10½	
Burmah	61/3	+7½d
Canadian Eagle Bearer	32/9	
Mexican Eagle	26/3	+9d
Shell	4⅜	+ ⅛
Trinidad Leasehold	31/-xd	+9d
T.P.D.	34/6	−6d
Ultramar	31/1½	−1/4½

Company News & Views

Prospective Kaffir Dividends

The end-year dividends of the Rand gold mining companies are now awaited. Although the Mining Houses will, as usual, wish for the best showing to be made, the downward trend in profits forewarns a possible scaling down of payments.

In the Central Mining list, interest is centred on Blyvoor. The September quarterly earnings, after tax and including premium, were running at an annual rate of 3s., so that a repetition of the June 1s. 4d. is expected. Working profits to date for 1951 of Con. Main Reef, City Deep and Crown Mines are lower than for the corresponding period of last year; those of the latter producer being half-a-million pounds less and a lower payment than the June 5s. 6d. is thought probable. East Rand Prop.'s profits are only slightly down, hence a repetition of the 2s. 6d. paid for each of the previous three half years may be forthcoming. A smaller amount from Modder East would not surprise in view of the chairman's remarks at the recent meeting. Durban Deep is looked to for a repetition of last December's final of 3s., and a similar amount may be forthcoming from Rose Deep.

Forewarning of a drop in Luipaards Vlei's payment was given at the recent annual meeting. Other members of the Gold Fields group likely to pay less are Simmer & Jack and Robinson Deep; the latter's profits this year are, in the aggregate, less than one-third of those for 1950. Vlakfontein should be able to distribute 1s., but not so Venterspost as profits show a big decrease. Those of "Vogels" have been maintained and a repetition of the last two half-yearly payments of 1s. is expected. A continuation of the downward revision in payments which has taken place since June of last year is thought unavoidable in the case of Sub Nigel.

A drop of over £400,000 in Daggafontein's profits this year forewarns a lower dividend from this Anglo American producer but East "Dagga" may be able to repeat its June amount. Brakpan's profits should permit the payment of 1s. and Western Reef's 1s. 3d. "Sallies" may again prove the "star" turn of this enterprising group and continue with its consistent increases in payments which have been made since June 1949. Springs lower aggregate profits do not justify the hope of last December's 7½d. being repeated.

Although Geduld's profits are much lower, those of the neighbouring mine belonging to Union Corporation—East Geduld, have kept up well. The former may not pay more than 7s. a share, while the latter could repeat last December's 2s. 4½d. Grootvlei has been doing well and may distribute 1s. 7½d. while Marievale's profits are higher and a small increase on the previous payments of 1s. would not surprise.

Most of "Johnnies" mines are relying on premium sales to keep them going and their aggregate profits this year are down considerably. Government Areas may be able to pay 1s., but a lower amount than the June decreased payment is likely from Randfontein. New State Areas and East Champ d'Or may distribute about 3d.

Shareholders have been warned by Rand Leases (Anglo-Transvaal) not to expect maintenance of the usual 2s. half-yearly payment in view of requirements for capital expenditure. General Mining's producer, West Rand, may manage to repeat its previous 1s. 6d., and the other member, South Roodepoort, the customary 9d. per share.

Lake View and Star's Larger Output

The closing down or curtailment of operations of one or two of the smaller mines in Kalgoorlie proved to be a direct benefit to Lake View and Star during the year to June 30 last as the labour released from these mines was re-employed by Lake View. While much of this new labour was inexperienced it was instrumental in enabling the company to increase the tonnage treated from 583,946 tons to 625,900 tons. Unfortunately, part of the advantage so gained was nullified by a fall in the average value of the ore treated from 4.76 dwt. per ton to 4.40 dwt. per ton but the total ounces of gold recovered improved to 131,706 against 123,713 previously. In addition to this output won by mining operations, a further 8,916 oz. was recovered from retreatment of tailings.

Although the higher tonnage crushed served to some extent to keep down working costs, wage increases, together with the rise in costs of supplies and rail freights raised the average working cost per ton to 35s. 2d. against 30s. 9d. the previous year. This repercussed adversely on the ore reserve position and 119,000 tons of marginal ore have had to be eliminated from the reserve figure which at the fiscal year end stood at 4,100,400 tons averaging 4.72 dwt., a decrease of 192,000 tons as compared with the preceding year. Total development footage advanced was 21,867 ft. against 17,500 ft., the improvement being directly due to the additional labour force available.

The profit and loss account reflected the greater tonnage crushed and larger output. Revenue from the sales of bullion amounted to £1,751,888 compared with £1,508,101. The mine working expenditure, however, was also higher, £1,003,046 against £819,681, as was the total tax liability which amounted to £342,000 against £323,000, which cut back the net profit figure to £227,260 compared with £249,256. Dividend payments totalled 62½ per cent (same), the provision made for depreciation of plant and machinery was £26,990 (£25,687), leaving £49,428 (£36,379) to be carried forward.

The annual meeting will be held in London on December 12. Sir Joseph Ball is chairman.

Harrisons & Crosfield Has Another Good Year

Harrisons & Crosfield, the well-known Eastern import and export merchants, have experienced another successful year.

During the year to June 30, 1951, the consolidated profit and loss account showed that group trading profits advanced from £1,229,232 to £1,571,344. The other important item which helped to raise gross revenue to £1,704,118 (£1,410,178) was income from trade investments which went ahead to £102,827 compared with £83,707 the previous year. After charging all expenses including U.K. taxation amounting to £781,901 (£705,595) and minority interests of £14,328 (£24,067) net profit attributable to the parent company stood at £618,802 as against £451,668 in the preceding year.

From the £1,077,081 (£870,607) available, the parent company allocated £100,000 (nil) to a reserve to cover unremitted profits earned in territories from which transfer is restricted and £50,000 (nil) to stock depreciation reserves. The appropriations of the subsidiary companies followed a similar pattern and to general reserve was allocated £69,968 (nil), £100,000 (nil) was transferred to stock depreciation reserve, and a further £60,000 (same) was set aside for future U.K. taxation. Dividend payments aggregating 30 per cent absorbed £155,304 and included the distribution of 10 per cent for the year on management shares. Of the £541,809 remaining £258,770 (£255,849) was carried forward by the parent company and £283,039 (£192,593) by the subsidiaries.

While the Harrisons & Crosfield group's activities and interests are many and varied, the improved profit position, as seen in the above figures was probably due in large part to the higher prices paid during the year under review for many of the commodities with which the group deals, and

more particularly to the sustained high prices received for rubber.

The annual meeting will be held in London on December 18. Mr. H. Eric Miller is chairman.

Remarkable Progress Achieved by Barclays (D.C. & O.)

While the most striking feature in the figures given in the full report and accounts of Barclays Bank (Dominion, Colonial and Overseas) for the year to September 30 last was an increase of £61,735,744 in deposits to the record figure of £445,769,606, no less indicative of the rapid progress of this comparatively young financial institution was the expansion in total assets by £70,150,670 to £504,384,145. Advances during the year under review rose by £33,965,738 to £143,638,355. Although this remarkable progress is partly due to the general inflationary situation and to the steep increase in many of the commodities produced in the colonies and other areas served by the bank, no small measure of the success achieved is due to those who guide the bank's fortunes.

Referring to the crushing burden of taxation, the chairman, Mr. J. S. Crossley, said that it "cannot fail to exert an inflationary influence over the whole economy. While reducing on the one hand the reward for initiative and effort and so discouraging production, on the other hand it encourages waste and extravagance." One of the consesequences of such burdensome impositions, he added, has been the tendency for companies with important interests overseas to transfer their domiciles out of this country. Unfortunately, the authorities, instead of introducing legislation which would cut away the underlying cause of the migration, legislation was introduced to prohibit the migration itself. This purely negative action, Mr. Crossley said, provides no solution at all.

As previously announced, the directors are proposing a one-for-four scrip bonus and the raising of fresh funds by a call of £1 on the B shares.

The annual meeting will be held on December 28.

Rand and O.F.S. Mine Returns for November

The most prominent features in the Kaffir outputs for November were the first returns of St. Helena and Welkom Gold. Both showed losses, as indicated hereunder. The shorter month was reflected in the tonnage level of the mines generally; only two dealt with more ore than in the previous month, four milled the same and the remainder less. Thirteen mines announced higher profits; those of the balance being lower. There was no definite trend in working costs. Increases were recorded on 22 mines; five worked for the same figure as in the previous month and 15 were lower.

Tonnages and profits of all the members of the Central Mining group were lower with the exception of New Modder whose profit was slightly in advance of the previous month's total; that of Blyvoor was over £24,000 down, Crown Mines £5,000 and East Rand Props £8,000 less. Con. Main Reef and Modder B worked for the same figure as in October, while Blyvoor's costs were 6d. per ton lower at 44s. Those of all the other members were higher.

Of the Anglo American Corporation mines, the same tonnage as in October was dealt with by both Western Reefs and "Sallies"; the latter's profit being better by £2,264 with costs 5d. per ton lower at 28s. 11d. The first return of Welkom Gold, which started production on November 1 showed a loss of £64,402 from a tonnage of 30,000, drawn almost entirely from development rock. Yield was 2,788 oz. (or 1.86 dwt. per ton). No figure of costs is given but it is stated that for the time being, development above that estimated to be required to maintain current milling is being charged to capital expenditure.

The Union Corporation gave the first return of St. Helena which dealt with 40,000 tons for a recovery of 5,128 oz. gold, equivalent to 2.56 dwt. per ton. Costs which include the provision of 20s. per ton in respect of development were high at 49s. 8d. There was a working loss of £35,778. Apart from absorption of gold in the plant, yield was affected by high proportion of development rock milled.

Lower tonnages were dealt with by all the Gold Fields producers with the exception of Venterspost which crushed the same amount of ore as in October. Profits were all lower with the exception of those of Robinson Deep. Libanon's showed a drop of £6,500 with a rise of 1s. 2d. per ton in costs to 38s. 8d. Sub Nigel worked at the same figure of costs, 48s. 5d. but profit was down by £5,500.

Although all the "Johnnies" mines dealt with lower tonnages, with the exception of Wit. Gold, profits were higher in all cases; those of Randfontein increased by £3,000 although working costs rose by 2d. per ton to 28s. 1d.

Figures of returns of the two General Mining members West Rand and South Roodepoort, were on a lower scale; tonnages and profits were down but there was also a drop in working costs. An increase of £3,800 was announced in the profit of Rand Leases (Anglo Transvaal), consequent upon a larger tonnage and drop of 5d. per ton in costs.

Blyvoor.—108,000 tons yielded 68,861 oz.; profit £622,905.
Brakpan.—112,000 tons yielded 21,269 oz.; profit £46,257.
City Deep.—165,000 tons yielded 32,672 oz.; profit £55,048.
Consol M.R.—187,000 tons yielded 25,336 oz.; profit £40,380.
Crown.—260,000 tons yielded 45,171 oz.; profit £65,048.
Daggafontein.—241,000 tons yielded 57,884 oz.; profit £427,475.
Durban Roodepoort.—178,000 tons yielded 31,034 oz.; profit £97,026.
East Champ d'Or.—32,000 tons yielded £61,058; profit £11,160.
East Dagga.—97,000 tons yielded 17,514 oz.; profit £74,736.
East Geduld.—143,000 tons yielded 42,911 oz.; profit £344,759.
E. Rand Prop.—217,000 tons yielded 45,139 oz.; profit £160,675
Geduld.—105,000 tons yielded 15,238 oz.; profit £41,566.
Govt. Areas.—229,000 tons yielded £393,472; profit £50,177.
Grootvlei.—193,000 tons yielded 42,079 oz.; profit £270,902.
Libanon.—77,000 tons yielded 14,477 oz.; profit £31,822.
Luipaards Vlei.—98,000 tons yielded 18,141 oz.; profit £49,572.
Marievale.—61,000 tons yielded 15,067 oz.; profit £72,775.
Modder "B".—52,000 tons yielded 6,037 oz.; profit £8,014.
Modder East.—116,000 tons yielded 13,928 oz.; profit £32,957.
New Kleinfontein.—102,000 tons yielded 13,707 oz.; profit £35,075.
New Klerksdorp.—9,930 tons yielded £14,440; profit £1,330.
New Modder.—21,500 tons yielded 2,838 oz.; profit £1,053.
New State.—43,000 tons yielded £89,600; profit £1,041.
Nigel.—35,600 tons yielded 4,827 oz.; profit £2,379.
Randfontein.—341,000 tons yielded £505,160; profit £30,168.
Rand Leases.—184,000 tons yielded £385,408; profit £81,854.
Rietfontein.—27,000 tons yielded 6,031 oz.; profit £30,043.
Robinson.—115,000 tons yielded 18,162 oz.; profit £9,257.
Rose Deep.—83,000 tons yielded 11,736 oz.; profit £16,275.
Simmer & Jack.—130,000 tons yielded 20,735 oz.; profit £28,333.
S.A. Lands.—118,000 tons yielded 20,718 oz.; profit £86,831.
St. Helena.—40,000 tons yielded 5,128 oz.; loss £35,778.
South Roodepoort.—27,000 tons yielded 5,962 oz.; profit £22,497.
Springs.—164,000 tons yielded 21,644 oz.; profit £27,022.
Sub Nigel.—66,500 tons yielded 23,292 oz.; profit £128,596.
Van Dyk.—100,000 tons yielded 15,109 oz.; profit £14,964.
Venterspost.—100,000 tons yielded 21,750 oz.; profit £58,236.
Village M.R.—34,100 tons yielded £66,148; profit £18,008.
Vlakfontein.—37,000 tons yielded 13,783 oz.; profit £89,018.
Vogelstruisbult.—79,000 tons yielded 19,948 oz.; profit £81,474.
Welgedacht.—34,000 tons yielded 4,045 oz.; profit £4,115.
Welkom.—30,000 tons yielded 2,788 oz.; loss £64,402.
West Rand Cons.—210,000 tons yielded 32,835 oz.; profit £140,228.
Western Reefs.—108,500 tons yielded 23,074 oz.; profit £112,451.
Wit. Gold.—60,000 tons yielded £85,681; profit £2,505.

RAND LEASES (VOGELSTRUISFONTEIN) GOLD MINING

The Nineteenth Ordinary General Meeting of Rand Leases (Vogelstruisfontein) Gold Mining Co., Ltd., was held on November 27 in Johannesburg, **Mr. S. G. Menell,** the chairman, presiding.

The following is an extract from his circulated statement:—

During the year under review no change took place in the company's mining property, which continues to comprise an area approximately 1,933 claims situate on the farms "Vogelstruisfontein" No. 6 and "Roodepoort" No. 5 district Roodepoort, in the mining district of Krugersdorp, held under Government lease, Mynpatchen and claim licences. The freehold property consists of an area of approximately 810 morgen on the farm "Vogelstruisfontein" No. 6, including the remaining extent of Hamberg Township.

The net amount charged to capital expenditure for the year totalled £182,609, details of which are listed in the directors' report. The main items of underground expenditure were £120,692 on the sinking and equipping of No. 11A sub-vertical circular shaft; £36,382, on a hoist and electrical equipment for the 19-27 level service winze; £15,121 on a hoist and electrical equipment to serve 27-0 vertical auxiliary development winze; £6,245 on sinking and equipping No. 2 Kimberley reef incline shaft; and £4,031 on pump station equipment.

The net profit for the year was £1,284,739, which included an amount of £165,825 received from the sales of gold for industrial and artistic purposes. This profit, when added to the balance of £214,533 brought forward from the previous year, made available on appropriation account an amount of £1,499,272.

Dividends Nos. 29 and 30, of 20 per cent each, absorbed £720,000, while the sum of £463,000 was reserved to cover estimated taxation and the Government's share of profits under the lease, leaving a balance on appropriation account of £316,272, which was carried forward to the current financial year.

The tonnage crushed for the year ended June 30, 1951, amounted to 2,220,000 yielding 360,582.13 oz. fine gold, equivalent to a recovery of 3.245 dwt. per ton crushed.

The working profit, including sundry revenue, for the year, amounted to £1,114,667, averaging 10s. per ton crushed. In addition, an amount of £165,825 accrued in respect of increased revenue from the sales of gold at higher than standard prices, sold for manufacturing purposes during the year.

Working costs per ton crushed averaged 30s. 9d., which included 4s. 9d. per ton in respect of development expenditure, and were 2s. 6d. higher than last year's working costs of 28s. 3d. per ton, which included 4s. 9d. for development.

In the course of his address to the meeting the Chairman said: As you are aware, the company has been engaged since 1946 on a capital expenditure programme on work associated with the exploitation of the Main Reef Series in the deeper areas of the mine, below the compass of No. 11 Vertical Shaft, as well as on work necessary to render available for milling, ore from the Kimberley and Bird Reef horizons. During the six years 1946 to 1951 capital expenditure totalled £806,661, of which £455,145 was expended till June 30, 1951, on the sinking and equipping of No. 11A sub-vertical circular shaft, which is designed to cater for the mine's secondary system of hoisting.

In order to make provision, in good time, for the rendering available of the still deeper areas of the Main Reef Series, it is now planned to commence work on the tertiary hoisting system of the mine. Capital expenditure on this new programme, together with expenditure on the completion of the present programme, is estimated to require £800,000, to be expended at an average rate of £200,000 per annum over the next four years.

During the year ended June 30, 1948, net capital funds of £801,866, after payment of underwriting and other expenses, were obtained towards the present capital expenditure programme from the issue of 600,000 shares at a price of 27s. 6d., and, of this, the balance of capital funds remaining at June 30, 1951, was £175,172.

In order to finance the capital expenditure requirements envisaged, it will thus be necessary to make appropriations from profits in the next four years, and the extent to which dividend payments will be affected will depend largely on the scale of operations achieved during these years, future working costs, and the amount of additional revenue which is received from sales of gold at enhanced prices for industrial and artistic purposes. As regards the immediate future, we cannot expect that the dividend of 2s., as paid for the last three half-years, will be maintained. In the first four months, July to October, of the current year, working profits have been adversely affected by the prevailing acute shortage of native labour.

The report and accounts were adopted.

GOLD FIELDS RHODESIAN DEVELOPMENT CO.

The Thirty-Ninth Annual Meeting of The Gold Fields Rhodesian Development Co. was held in London on Dec. 4. **Mr. Robert Annan** presided and in the course of his address said:

The balance of profit for the year at £81,454 is lower by £13,017 and, after deducting £23,439 for tax and £20,000 transferred to Depreciation Reserve, there is an available balance of £38,015 out of which your directors recommend the payment of a dividend of 6d. per share less tax,

After providing for the dividend recommended there is a balance of Current Assets over Current Liabilities of £96,438.

Regarding our operations in Southern Rhodesia, land sales during the year amounted to 37,236 acres, leaving a total land holding of 45,335 acres at the end of the period.

Gold mining operations suffered from a severe shortage of labour and there was a further increase in the cost of all supplies, resulting in a further rise in operating costs. In spite of the higher price received for gold during the year, the production of Southern Rhodesia again declined and was 8,285 oz. less than in the previous period.

Under the prevailing conditions it was no longer possible to continue operations at the Wanderer Mine at a profit and in April last the shareholders of that Company were advised that development of the mine would cease and that after extraction of such payable ore as remained, the plant and other assets would be realized. Mining operations are expected to cease at the end of this year and the Company has now been put into voluntary liquidation, after operating for 23 years. This investment has been well written down in our books in the past and now stands at a figure which we hope will be recoverable in the liquidation.

At the Motapa Mine the tonnage treated showed some increase but costs were higher by about 1s. 9½d. per ton and there was a sharp drop in the yield of gold due to the lower value of the ore reserve and to the increasingly refractory nature of the ore as the mine has been opened up. A thorough investigation of the metallurgical practice has been made and modifications to the plant, which it is expected will improve the recovery, have been put in hand. The adjoining Jupiter Mine is also being opened up and should contribute some ore of better grade to the plant. Repayment of the first instalment of this Company's loan has been postponed for twelve months. Small profits were earned and were more than sufficient to cover the necessary expenditure on the plant. These results are disappointing but we trust they will soon show an improvement.

At the Sebakwe Group the main operations have been directed to the erection of the treatment plant and to the provision of housing and water supply. The first unit of the plant was completed in May and production of concentrate has commenced. Owing to repairs to the Government Roasting Plant at Que Que the concentrate is being held in storage but advance payment of a proportion of the value is being received. Our policy for the present at this group of mines is to use earnings for further development, looking to an eventual increase in capacity.

During the year upwards of seventy-four properties were offered to the Company, of which sixty-seven have already been declined. Examination of the remainder is incomplete.

The Company has for a long time retained its interest in a special coal grant of 5,486 acres in the Tuli District. In view of the great demand for coal in Southern Rhodesia a fresh study is being made of the prospects of this district.

As regards our mining investments, the prospects are favourable. During the past year increased dividends were received from Lake View and Star, Luipaards Vlei, Oroville Dredging and West Witwatersrand Areas; in addition to which dividends were paid by Lake George Mining Corporation, Union Platinum, and Yukon Consolidated, which companies had made no distribution in the previous year. In addition to the investments now paying dividends we have interests in developing properties such as Doornfontein, West Driefontein and Welkom, which are all developing mines that promise to be of high grade and should come into production in the near future.

Through New Consolidated, Free State, Exploration Co. we have an interest in Harmony, another developing company of great promise, in addition to which drilling carried out by the Exploration Company is indicating other areas of interest. Our platinum interests in Waterval and Union Platinum should also do better at the increased rate of production. The indications are that our dividend income should continue to improve.

The report was adopted.

ANGLO-ECUADORIAN OILFIELDS

The Thirty-Third Annual General Meeting of the Anglo-Ecuadorian Oilfields, Ltd., was held on December 4, in London, the **Rt. Hon. Lord Forres,** the chairman, presiding.

The following is an extract from the Chairman's statement for the year to March 31, 1951:—

The increase in production of crude oil was maintained during the year under review, when production rose to 258,047 tons, compared with 245,927 tons for the previous year—an increase of nearly 5 per cent. The development of the shallow Santo Tomas field continued to be satisfactory, and as a result shallow production increased from 120,252 tons in the previous year to 137,456 tons.

Though deep drilling was again disappointing, results were somewhat more encouraging than in the year 1949-50, and deep production for the year only declined 5,084 tons, from 125,675 to 120,591 tons. Since the end of the present financial year a good deep producer has been brought in, and deep production is now averaging 125,000 tons annually.

We have recently engaged the services of a well-known firm of British petroleum consultants to assist us in improving our drilling and production methods. We are confident that considerable benefit will be derived from their experience once they have completed a study of the field.

The new plant in the Santo Tomas field operated satisfactorily throughout the year under review, and the total production of casinghead gasoline was 113,253 barrels, compared with 73,886 barrels in the year 1949-50.

The total footage drilled during the year was 111,016 ft. compared with 119,206 ft. during the previous period.

The number of wells completed was 52, compared with 55 in the previous period.

A deep test well in the northern part of the Concession was commenced in November, 1950. High gas pressure with a few slight traces of heavy oil were encountered at shallow depths, rendering drilling difficult. Casing was set at 1,500 ft. to facilitate drilling operations, but gas shows continued to be passed through, and since the end of the year under review, at 3,177 ft., gas accompanied by a very strong flow of salt water made it impossible to continue drilling and the well had to be abandoned. Preparations are now being made to drill an offset to this well. There will be, however, some delay before the new well can be spudded in, as it is essential that we should have on the site chemicals for making heavy muds and other requisite equipment for dealing adequately with high pressures before drilling is commenced.

In the Ancon area a well is being drilled to test formations underlying the deepest producing horizons, and the latest reports indicate that it has reached a depth of 8,400 ft.

Your company's refinery at La Libertad operated satisfactorily throughout the year. 151,207 tons of crude oil produced by the company and its subsidiaries were processed during the year, together with an additional 31,875 tons purchased from a neighbouring oil company.

The improvements to, and enlarging of, our refined products deposits throughout the country have now been virtually completed; the only work remaining to be carried out is of a minor character at one or two of our smaller and more outlying deposits.

During the past twelve months we have been obliged to incur considerable expenditure on two of our coastal tankers, and in view of the age of these vessels your Board has deemed it wise to place an order recently for the building of a new 1,400 ton deadweight tanker to replace one of these old vessels. Delivery of the new tanker is promised for October, 1953. The house-building programme was on a reduced scale, but the company continued to improve the living conditions of its workmen.

The collective contract with the workmen, to which I referred last year, terminated on December 31, 1950, and the field manager, after protracted discussions, negotiated a new collective contract for a period of two years. The total cost of wage increases and other concessions granted by the company under the new contract are estimated at present exchange rates to amount to £30,000 for the first year and a further £12,500 for the second year.

The net profit for the year amounts to £235,713, to which falls to be added £137,779 brought forward from the previous year, giving a total of £373,510.

Your Board recommended the payment of a dividend at the rate of 10 per cent. (less income tax), the allocation of £35,000 to general reserve, £367 to operational reserve, £16,905 to investments reserve, £100,930 to tax equalisation account and carrying forward the sum of £141,558.

The report was unanimously adopted.

PERAK RIVER HYDRO-ELECTRIC POWER CO.

STEADY PROGRESS MAINTAINED

The Twenty-Fifth Annual General Meeting of the Perak River Hydro-Electric Power Co., Ltd., was held on November 30 at Winchester House, Old Broad Street, London, E.C.

The following are extracts from the statement by the Chairman, **Mr. William Shearer:**—

The directors' report and accounts for the year ended 31st July, 1951, reflect the steady progress maintained during that period and the resultant strengthening of the financial position. The peak load increased from 49,300 kW. to 53,700 kW. and 353,000,000 units were generated which was 10 per cent above the figure for the previous year. The dredges working on our system increased from 28 to 32 while the gravel pump mines showed a slight advance from 125 to 127.

The gross revenue from the sale of power and rentals was £1,138,781 compared with £971,338 in the previous year, which was a 17 per cent expansion due to the greater number of units sold and to the increase in our tariffs which became effective from April 1 of this year. The full influence of this increase was, therefore, not reflected in the gross revenue for the year under review, but it must be borne in mind that the purpose of the adjustment was to counterbalance the inflationary trend in our operating costs. Unfortunately there is at present little indication of any halt in this upward direction.

In the past a high standard of continuity of supply has been maintained but unfortunately during the year under review, this has been interrupted to some extent by bandit activity. On ten occasions towers have been felled by cutting or by dynamite and this has accounted for the percentage time lost by consumers due to interruption of supply increasing from 0.1 per cent to 0.18 per cent. Even so, this figure is remarkable under the circumstances and is a measure of the fortitude and devotion to duty of all concerned in maintaining such a fine standard of supply.

Our subsidiary, the Kinta Electrical Distribution Co., continued to make very good progress during the year and it now supplies 44 towns and villages. In addition two of the isolated Government squatter settlements are being supplied and extensions made to others within the towns. The units sold increased from 7,600,000 to 9,400,000, while the number of consumers connected increased from 6,871 to 8,208.

The 5 per cent Guaranteed Debenture Stock created in 1926 appears in our accounts for the last time. Payment of the final instalment of the Sinking Fund and redemption of the outstanding stock took place during the year, together with the repayment of £300,000, representing the balance of advances made by H.M. Treasury under their guarantee to meet Sinking Fund and interest payments during the war years and after when the company had no funds available. It is pleasing to record that the company is now, for the first time in its history, free from any charge on its assets.

Turning to the Revenue Account, the gross surplus on operation is £678,045 which, together with sundry receipts, makes an amount available of £691,520: after the deduction of London expenses and directors' fees the sum of £675,154 becomes available for appropriation and has been dealt with as follows: Depreciation, £107,150; Guaranteed Debenture Stock Sinking Fund, £92,850 (which amount has been transferred to depreciation account making a total of £200,000 for the year); interest on Guaranteed Debenture Stock and advances, £10,953; provision for taxation on the profits for the year, £300,000.

The balance remaining is £164,201 and after bringing in £58,327 from the previous year and £26,536 provision for bad debts, etc., no longer required, a sum of £249,064 is available, out of which the sum of £50,000 has been allocated to Fuel Equalisation Reserve.

Last year I mentioned that we hoped it would be possible to take some positive steps this year in connection with the arrears of the Preference Share Dividend. Having regard to the fact that we have liquidated our entire debenture debt, and also that after considerable delay, consent to the increase of our tariffs has been received, the directors have decided to pay three years of the arrears of the Preference Share Dividend absorbing, less income tax, the sum of £98,438, leaving £100,626 to be carried forward to the next account.

I do not propose to make any prophecy as to what may happen in the current year, but the returns received to date showed an improvement over last year's figures. If this improvement continues I see no reason why the board should not be able to take further steps in regard to dividend payments.

The report was adopted.

October Mine Returns

Gold

WEST AFRICA

Amalgamated Banket.—58,839 tons yielded 8,819 oz.; profit £26,737.
Ariston.—28,360 tons yielded £124,880; profit £53,078.
Ashanti.—18,000 tons yielded 13,524 oz.; profit £60,171.
Bibiani.—30,019 tons yielded 6,025 oz.; profit £13,676.
Bremang.—Four dredges treating 622,200 cu. yd. yielded 2,756 oz.; profit £22,009.
Gold Coast M.R.—8,749 tons yielded 3,169 oz.; profit £12,573.
Konongo.—1,920 tons yielded 2,214 oz.; profit £10,239.
Marlu.—40,700 tons yielded 2,875 oz.; profit £293.
Nanwa.—4,100 tons yielded 800 oz.
Taquah.—21,000 tons yielded 4,787 oz.; loss £2,531.

INDIA

Champion.—14,780 tons yielded 6,030 oz.
Mysore.—16,400 tons yielded 5,651 oz.
Nundydroog.—21,018 tons yielded 4,445 oz.
Ooregum.—9,850 tons yielded 2,495 oz.

AUSTRALIA

Boulder Pers.—(Oct. 10-Nov. 6) 11,122 tons yielded 2,544 oz.
Central Norseman.—(Oct. 10-Nov. 6) 11,049 tons yielded 3,652 oz.
Croesus Prop.—(Oct. 10-Nov. 6) 7,240 tons yielded 1,723 oz.
Gold Mines of Kalgoorlie.—(Oct. 10-Nov. 6) 13,382 tons yielded 4,034 oz.
Kalgoorlie Enterprise.—(Oct. 10-Nov. 6) 4,457 tons yielded 1,271 oz.
Kalgurlie Ores.—(Oct. 10-Nov. 6) 11,769 tons yielded 2,723 oz.
Lake View & Star.—(Oct. 10-Nov. 6) 49,857 tons and 38,248 tons tailings yielded 11,323 oz.
Morning Star (G.M.A.).—(Oct. 10-Nov. 6) 1,590 tons yielded 732 oz.
New Coolgardie.—Oct. 10-Nov. 6) 1,590 tons yielded 1,831 oz.
Sons of Gwalia.—(Sept. 11-Oct. 9) 5,610 tons yielded 1,434 oz.
South Kalgurli.—(Oct. 10-Nov. 6) 8,105 tons yielded 2,349 oz.; profit £7,153.

MISCELLANEOUS

Cam & Motor.—22,000 tons yielded £64,549, profit £27,538.
Clutha.—(Oct. 13-Nov. 9) dredge worked 435 hours yielding 499 oz.
Frontino.—9,937 tons yielded 6,346 oz.
Kentan (Geita).—16,000 tons yielded 2,656 oz.
Martha.—(19 days ended Nov. 3) 6,907 tons yielded 2,041 oz. gold, 13,815 oz. silver.
Motapa.—23,700 tons yielded 2,402 oz.; profit £3,084.
Rezende.—6,600 tons yielded £13,564; profit £1,006.
Rosterman.—2,100 tons yielded 837 oz.; profit £1,254.
Sherwood Starr.—2,210 tons yielded £2,709; profit £534.
St. John D'el Rey.—34,500 tons yielded £239,247.

Tin

MALAYA

Ampat.—121 tons tin conc.
Batu Selangor.—29½ tons tin conc.
Berjuntai.—48½ tons tin conc.
Ipoh.—9½ tons (annual boiler inspection and general running repairs).
Jelapang.—23 tons tin conc.
Kampong Lanjut.—35¼ tons tin conc.
Kamunting.—185½ tons tin conc. (dredge No. 5 closed down 6 days for repairs).
Kinta Tin.—33½ tons tin ore.
Klang River.—30½ tons tin conc.
Kramat Tin.—23½ tons tin conc.
Kuala Kampar.—206 tons tin conc.
Kuchai.—128¼ tons tin conc.
Larut.—76½ tons tin conc.
Lower Perak.—66 tons tin conc.
Malaysiam.—4 tons.
Pahang.—240 tons tin conc.
Rahman.—49½ tons tin ore.
Rantau.—72 tons tin conc.
Rawang Conc.—74 tons tin conc.
Rawang Tin.—106¼ tons tin conc.
Renong.—87½ tons tin ore.
Southern Kinta.—291½ tons tin conc.
Sungei Kinta.—22¾ tons.
Taiping.—23 tons tin conc.
Tambah.—7¼ tons tin conc.
Tanjong.—100 tons tin ore.
Tongkah Harbour.—47¾ tons tin conc.

NIGERIA

Amalgamated Tin.—417 tons tin conc. and 23 tons columbite.
Bisichi.—64 tons tin and 12 tons columbite.
Ex-Lands Nigeria.—46 tons conc.
Gold and Base Metals.—49 tons conc.
Jantar Nigeria.—20 tons tin and 18 tons columbite.
Jos Tin.—14¾ tons conc.
Kaduna Prop.—7 tons tin ore.
Kaduna Synd.—22 tons tin ore.
Keffi.—22 tons tin conc.
Naraguta Extended.—9¾ tons tin ore.
Naraguta Karama.—18¾ tons tin ore.
Naraguta Tin.—21¼ tons tin ore and 4 tons columbite.
Ribon Valley.—11 tons conc.
Rukuba.—1¼ tons tin ore.
South Bukeru.—3 tons tin ore.
Tin Fields of Nigeria.—3¾ tons tin ore.
United Tin Areas.—9 tons conc.

MISCELLANEOUS

Beralt Tin.—205 tons wolfram conc. and 5 tons tin conc.
Geevor.—60 tons black tin (65 per cent Sn.).
Kamra.—21 tons.
South Crofty.—30 tons black tin.

Coal & Miscellaneous Base Metals

Amal. Collieries.—619,142 tons coal.
Apex Mines.—98,150 tons coal.
Blesbok Colliery.—45,255 tons coal.
Broken Hill South.—(Oct. 6-Nov. 3), 25,170 tons ore (assaying 73.1 per cent lead, 52.4 per cent zinc and 41 oz. silver) yielded 4,269 tons lead conc. and 5,092 tons zinc conc.
Coronation.—88,244 tons coal.
Dundee Coal.—43,302 tons.
Mount Isa.—45,250 tons yielded 2,775 tons lead-silver bullion assaying 84.4 oz. silver per ton and 3,574 tons zinc conc.—low production due to change over to new crushing plant.
Natal Navigation.—136,494 tons coal.
New Broken Hill.—(Sept. 15-Oct. 13), 17,715 tons ore (assaying 9.7 per cent lead, 12 per cent zinc and 2.3 oz. silver) yielded 2,146 tons lead conc. and 3,784 tons zinc conc.
South African Coal Estates.—142,401 tons coal.
Wankie Colliery.—202,373 tons coal sales and 9,292 tons coke sales.
Witbank Colliery.—119,963 tons coal.

RAND SELECTION CORPORATION LTD.

(INCORPORATED IN THE UNION OF SOUTH AFRICA)

DECLARATION OF DIVIDEND

NOTICE IS HEREBY GIVEN that Dividend No. 74 of 40 per cent equal to 2s. per share has been declared for the year ending 30th September, 1951, payable to shareholders registered in the books of the Corporation on the 14th Dec., 1951, and to persons presenting Coupon No. 75 from Share Warrants to Bearer.

The dividend is declared in the currency of the Union of South Africa and becomes due on the 15th December, 1951, and warrants will be posted from the Head and London Offices on or about the 18th January, 1952.

The dividend is payable subject to the usual conditions which can be inspected at the Head and London Offices of the Corporation.

The Transfer Books and Register of Members will be closed from the 15th December to the 21st December, 1951, both days inclusive.

Holders of Share Warrants to Bearer are notified that the dividend is payable at Barclays Bank (Dominion, Colonial and Overseas), Circus Place, London Wall, E.C.2, or at the office of the Guaranty Trust Co. of New York, 27, Avenue des Arts, Brussels, Belgium, on or about the 21st January, 1952. Coupons must be left four clear days for examination.

The effective rate of Non-Resident Shareholders' Tax is 6.6 per cent.

The profit for the year after providing for taxation was £697,000 (previous year £563,000).

By Order of the Board.
For and on behalf of
ANGLO AMERICAN CORPORATION OF SOUTH AFRICA, LIMITED.
London Secretaries.

London Office: W. E. GROVES.
11, Old Jewry, E.C.2.
30th November, 1951.

Metal and Mineral Trades

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